Order No. MAC0212096C3

Service Manual

Room Air Conditioner

CW-C120VR

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

1. Product Specifications

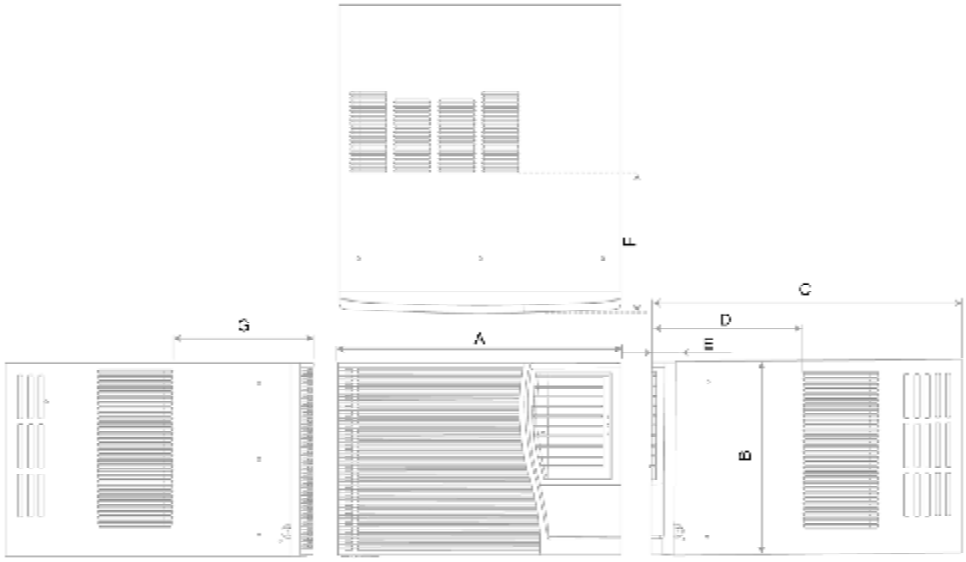
		Unit	CW-C120VR
Phase		Ø	Single
Voltage		V	220 ~ 240
Frequency		Hz	50
Cooling Capacity		kW Btu/h	3.55 ~ 3.60 12,100 ~ 12,300
Running Current		A	6.3 ~ 6.4
Input Power		W	1.32k ~ 1.41k
EER		(W/W)	2.69 ~ 2.55
		Btu/hW	9.2 ~ 8.7
Starting Current		A	27
Compressor Output		W	950
Fan Motor Output		W	46 ~ 57
Noise Level	Indoor / (High / Low)	dB(A)	48 / 45 ~ 50 / 47
	Outdoor (High / Low)	dB(A)	56 / 53 ~ 57 / 54
		Power dB	69
Moisture Removal		L/h / Pt/h	2.1 / 4.4
Air Circulation	Indoor	m3/min (ft3/min)	9.8 (350)
	Outdoor	m3/min (ft3/min)	16.0 (565)
Dimensions	Height	mm / (inches)	375 / (14-25/32)
	Width	mm / (inches)	560 / (22-1/16)
	Depth	mm / (inches)	606 / (23-7/8)
Net Weight		kg / lb	38 / 84
Gross Weight		kg / lb	41 / 90
Refrigerant (R-22)		g / oz	560 / 19.8

- Specifications are subject to change without notice for further improvement.

2. Dimensions

2.1. CW-C120VR

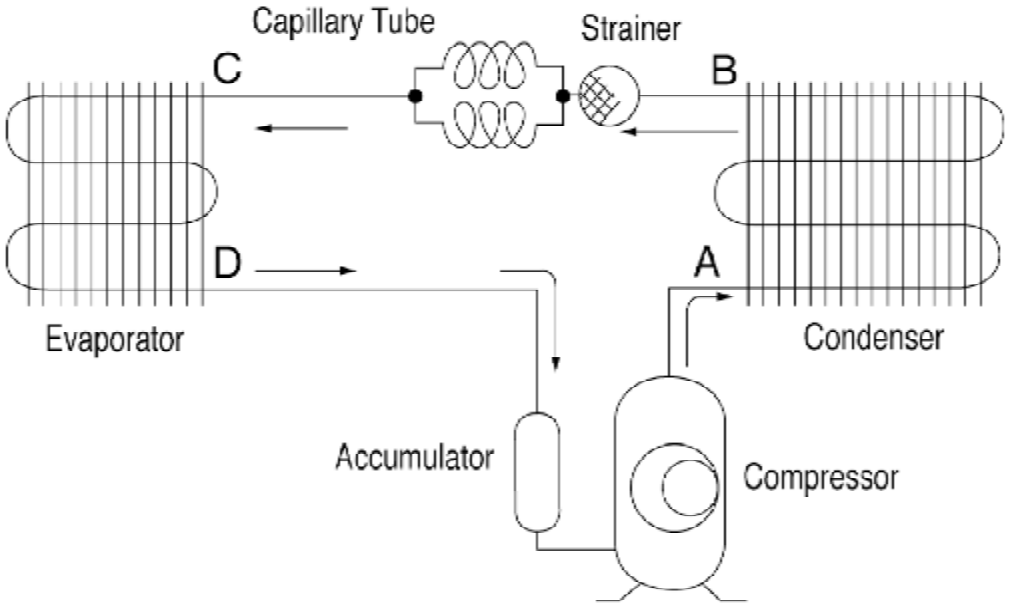
2.1.1. Top View, Front View and Side View



2.2. Unit

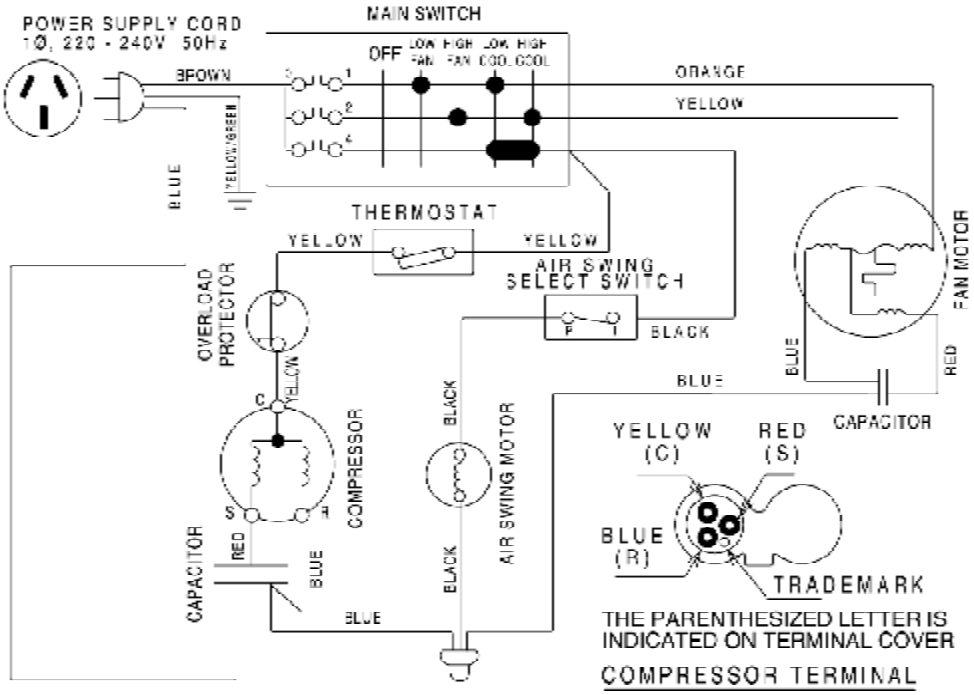
Item	Unit: Inch (mm)
A - Width	22-1/16” (560)
B - Height	14-25/32” (375)
C - Depth	23-7/8” (606)
D	11-9/16” (294)
E	1-13/16” (46)
F	11-3/32” (281.6)
G	11-3/32” (281.6)

3. Refrigeration Cycle Diagram



Item	Pressure (MPa)	Temperature (°C)
A	1.82 ~ 2.02	66 ~ 81
B	1.72 ~ 1.92	36 ~ 46
C	0.51 ~ 0.57	6 ~ 11
D	0.48 ~ 0.54	9 ~ 16

4. Wiring Diagram



4.1. Resistance of Fan Motor windings and the rated Capacitor

Model	CW-C120VR
Connection	CWA921145
Blue - Yellow	84.1 Ω
Yellow - Orange	55.6 Ω
Red - Yellow	118.3 Ω
Capacitor	DS441305BPQH (3 μF, 440VAC)

4.2. Resistance of Compressor windings and the rated Capacitor

Model	CW-C120VR
Connection	2KS206D5DA04
C-R	2.293 Ω
C-S	3.245 Ω
Capacitor	DS371356CPNA (35 μF, 370VAC)

Note: Resistance at 20°C of Ambient Temperature.

5. Air Conditioner Performance Evaluation

Intake & Discharge Air Temperature Difference	Current Drain	Determination	Remedy
-8°C and over (14.4°F)	-As specified.	-Nothing wrong.	-None.
-8°C and over (14.4°F)	-Higher than specified.	-Nothing wrong, outdoor temperature is too high, heat radiation is not efficient.	-Improve heat radiation.
-Under 8°C (14.4°F)	-Higher than specified.	-Something is preventing heat radiation.	-Excessive amount of refrig -Improve heat radiation.
-Under 8°C (14.4°F)	-Lower than specified.	-Leakage of refrigerant or refrigerant system is blocked.	-Locate and repair leak. -Flush refrigeration cycle.
-Under 8°C (14.4°F)	-Higher than specified by 50%.	-Compressor defect.	-Replace the compressor.

Note: Room air humidity is relatively higher, the temperature difference will be smaller.

6. Troubleshooting Guide

⚠**Warning: Disconnect unit from electrical power supply before making any electrical checks.**

Trouble	Check	Result	Cause	Ren
Fan Motor and Compressor won't run.	-Supply Voltage -Fuse Box or Circuit Breaker. -Power cord or Wiring Harness. -Temperature Setting.	-Less than 10% by Rated. -Open Contacts. / -Pulled loose or Shorted. / -Higher than room temperature	-Temporary or Permanent? -Customer Restarted unit immediately without waiting 3 minutes.	-Consult ELE if permanent. -WAIT FOR 3 MINUTES. -Repair Open -Repair or Re -Set it LOWE
Fan motor won't run (Compressor run).	-Objects around Fan. -RESISTANCE between Wires. -Capacitor Fan Motor. -Main Control Switch.	-Locked Fan. -Shorted / Open circuit. -OHM Meter doesn't Deflect. -No contacts at Position Shown.	-Fan Hitting Cowling. -Foreign Materials. -Frozen Bearings. -Shorted or Burned out. -Capacitor Defect. -Main Control Switch defect.	-Adjust Fan p setting screw. -Remove Fore Materials. -Replace Fan -Replace Fan -Replace Cap -Replace Mai Switch.

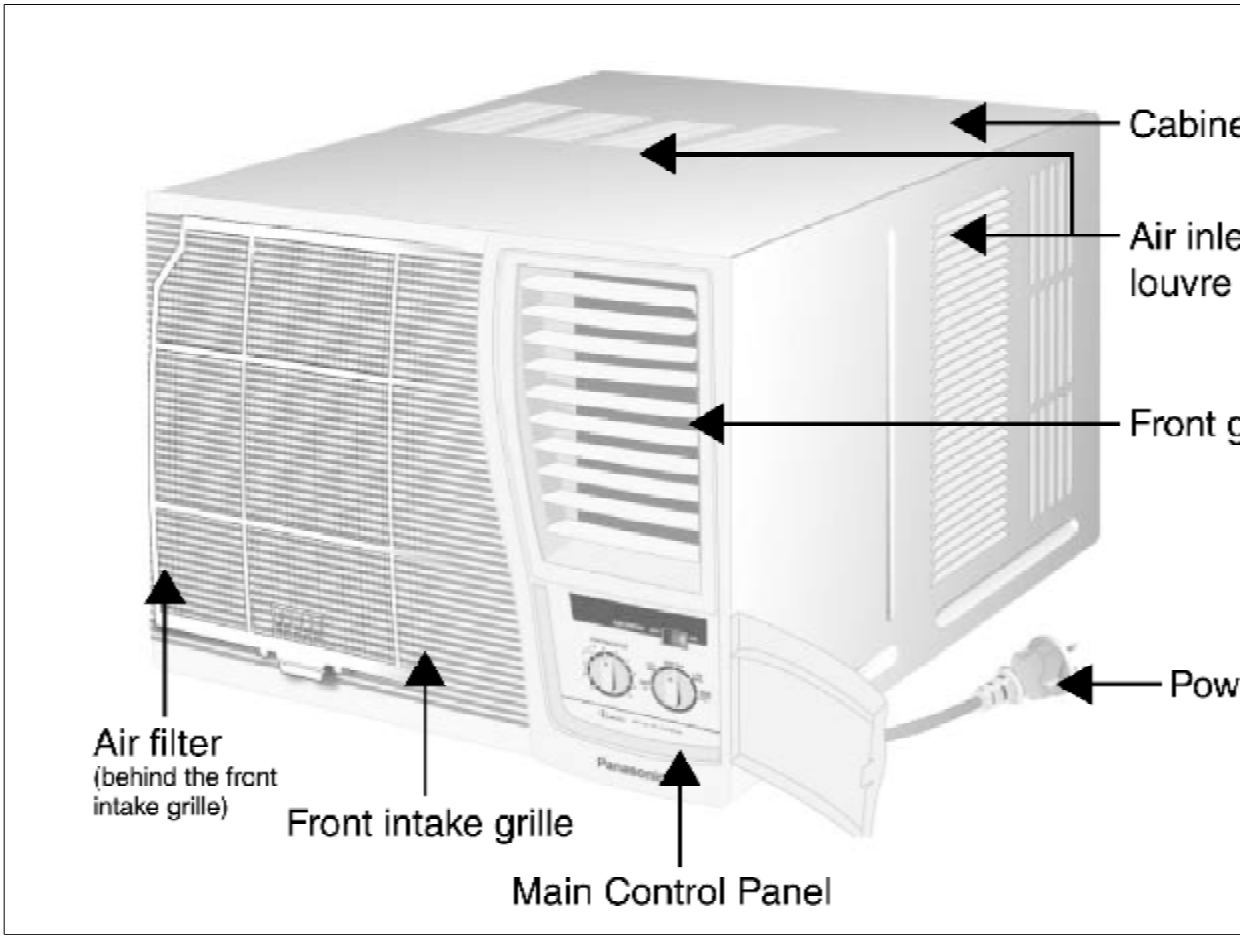
Trouble	Check	Result	Cause	Ren
Compressor won't run (Fan run).	-Temperature setting. -RESISTANCE between Terminal and the Compressor Body. -RESISTANCE between Terminals. -Overload Protector. -Capacitor Compressor. -Thermostat. -Main Control Switch.	-Higher than room temp. -Shorted. -Shorted. -Infinity between Terminals. -OHM Meter doesn't deflect. -No click heard. -No contacts at Position Shown.	-Winding Coil touched to the compressor shell. -Rear Shorted or Burnt out. -Rear Shorted or Burnt out. -Overload Protector defect. -Capacitor defect. -Thermostat defect. -Main Control Switch defect.	-Set it lower. -Replace Com -Replace Com -Replace Ove Protector. -Replace Cap Compressor. -Replace The -Replace Mai Switch.
Air Swing won't run	-Air Swing Switch. -Resistance between wires.	-OFF position. -No contact at position. -OHM Meter doesn't deflect.	 -Open circuit -Shorted or open circuit.	-Set it ON. -Replace Air S Switch. -Replace Air S Motor.
Insufficient cooling.	-Temperature Setting. -Ventilation door open. -Air filter dirty. -Location of installation. -Evaporator/Condenser Coil obstructed. -Unit capacity for the room too small. -Temperature difference and running current.	-Higher than room temperature. -Open. -Clogged or dirty. -Sunlight hitting outdoor side. -Obstacles. -Clogged or dirty. -Not satisfied. -REFER TO PERFORMANCE EVALUATION.	-Reduces capacity. -Restricted air circulation. -Restricted Heat Exchanger. -Restricted Heat Exchanger. -Restricted air circulation. -Leakage of refrigerant or refrigeration system is blocked.	-Set it lower. -Close ventila -Clean or repl Filter. -Consider bui AWNING. -Remove obst reinstall unit. -Clean the coi -Replace the u bigger one. -Locate repai -Flush refrige cycle.
Noise	-Source of Noise	-Vibration. -Intermittent Noise.	-Faulty installation. -Fan hitting objects. -Refrigerant tubing touching each other. -Fan splashing Drain Water.	-Reinstall unit Reinforce the installation. -Adjust Fan p remove foreig materials. -About 1/2" C needed. -Remove drai mount a drain remove the wa -Set the Drain downward, so Drain water ca
Water dripping inside room.	-Unit installation. -Drain Tray-Styrofoam pieces blocking drain channel.	-Tilted to inside room. -Clogged.	-Restricted run off. -Clogged or blocked.	-Tilt unit to ou slightly. -Remove the f materials.

Trouble	Check	Result	Cause	Ren
Frozen Evaporator	-Temperature setting. -Air Filter/Evaporator. -Temperature difference and running current.	-Set too low for ambient conditions. -Clogged or Dirty. -REFER TO PERFORMANCE EVALUATION	-Outdoor temperature low (Night time). -Restricted air circulation. -Leakage of refrigerant or refrigeration system is blocked.	-Set the Main knob to Fan to and set the Temperature higher temper -Clean Air filter/Evaporat -Locate and r -Flush refrige cycle.

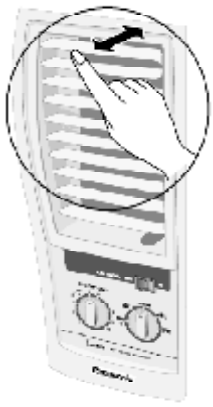
7. Operating Instructions

7.1. Parts Identification

7.1.1. Main Unit



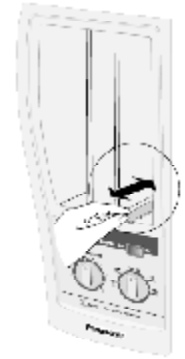
7.1.1.1. Vertical Airflow Direction Vane



Airflow direction adjustment up -down.

-The vertical airflow direction vane is controlled by rotating the horizontal vane forward or backward.

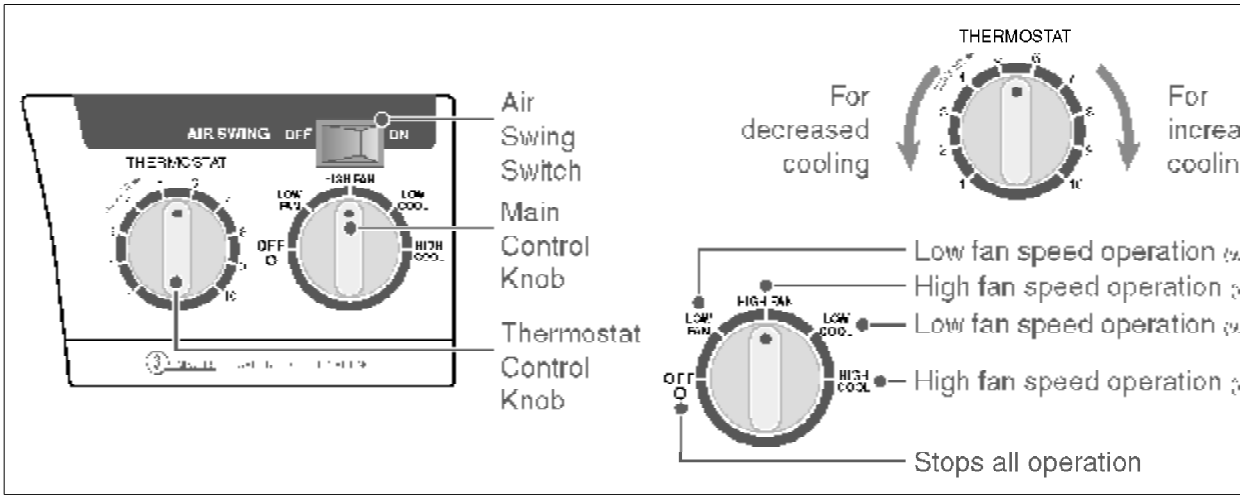
7.1.1.2. Ventilation Lever



The ventilation lever must be in the CLOSE position in order to maintain the best cooling conditions.

When fresh air is necessary in the room, set the ventilation lever to the OPEN position. The damper is opened and room air is drawn out.

7.1.1.3. Main Control Panel



7.1.2. Operation Conditions

Use the air conditioner under the following conditions:

- Operating temperature range.

	Indoor side		Outdoor side	
	D.B.T.	W.B.T.	D.B.T.	W.B.T.
Maxi Temperature	32°C	23°C	43°C	26°C
Min Temperature	21°C	15°C	21°C	15°C

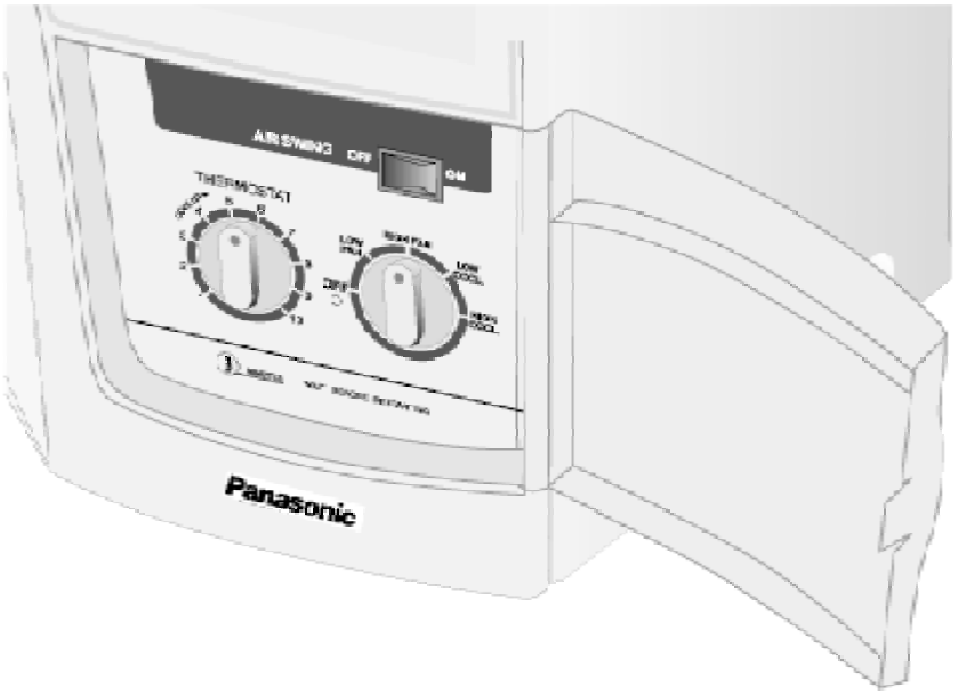
D.B.T.: Dry Bulb Temperature
W.B.T.: Wet Bulb Temperature

NOTE: Humidity may exceed 90%.

- Continuous operation at over 90% high humidity may create condensation and result in waterdrops on the intake and outlet vanes.

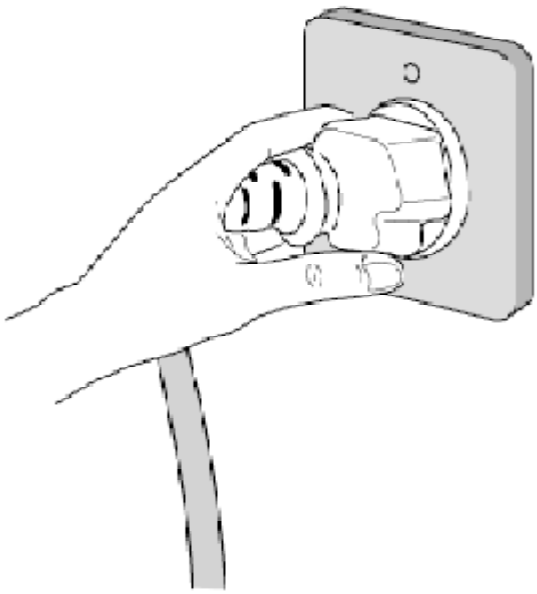
7.2. How to operate

Fig. 1



1. Open the control panel cover.

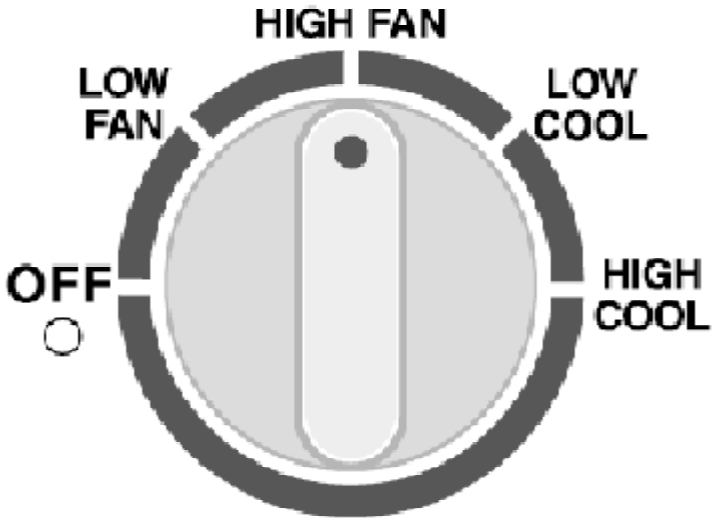
Fig. 2



2. Power Supply

Switch off the breaker and set the main control knob to the OFF position before plugging the power plug into an electrical outlet.

Fig. 3

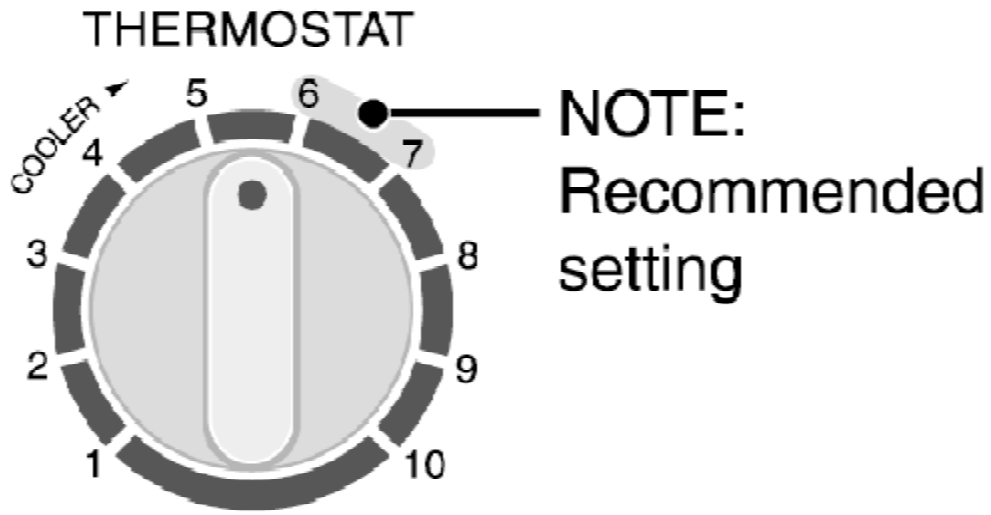


3. Main Control Knob

Set to LOW COOL or HIGH COOL as desired. (FAN setting operates the fan only.)

Caution: If the main control knob is turned off or changed to a fan setting from a cooling operation setting, WAIT at lease 3 minutes before resetting to cooling operation.

Fig.4

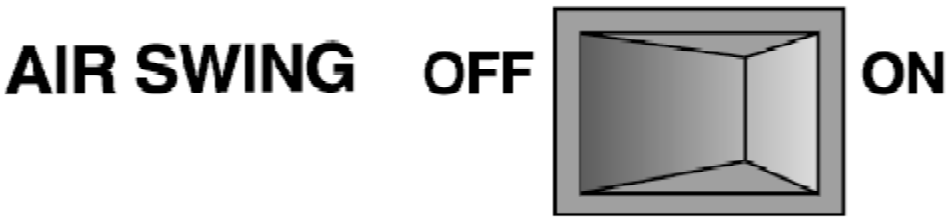


4. Thermostat Control Knob

- **For a room that is too warm, set the control knob to a clockwise direction.**
- **If the room is too cool, set the control knob to a counter clockwise direction.**

*** Note: Usually 6~7 is the recommended setting position.**

Fig. 5



5. Air Swing Switch
(Airflow direction adjustment Side-to-Side)
To obtain a fixed airflow direction, set the air swing switch to "ON" for the vanes to swing from side to side until the desired flow direction is reached, then switch it to "OFF".
For continuous side-to-side air circulation, set the air swing switch to "ON".

8. Installation Instructions

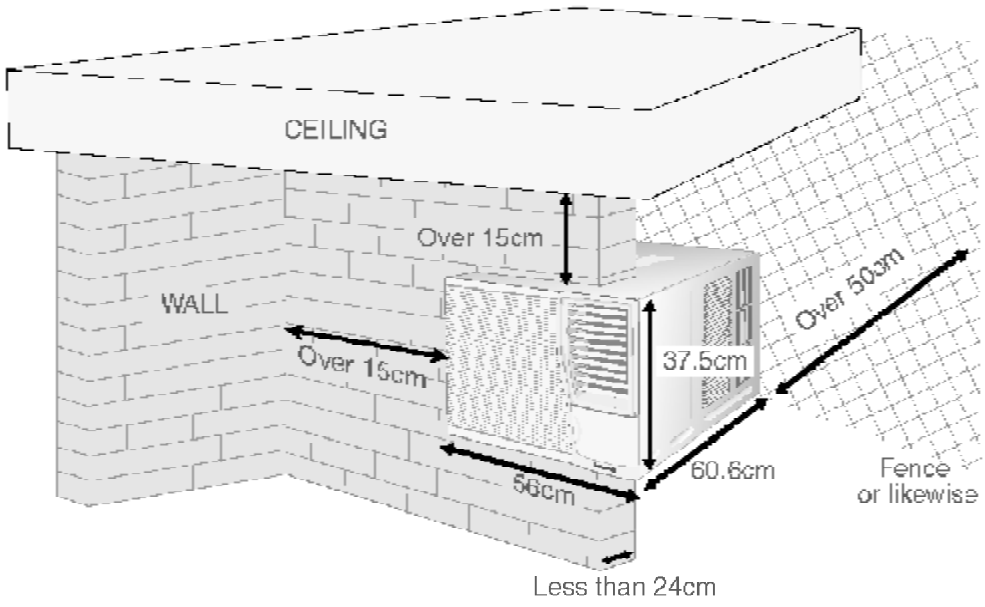
8.1. Choosing the Installation Location

- When installing, use the nearest power socket. Make sure the power socket is easy to reach so you can quickly disconnect your air conditioner in case of emergency.
- Ensure that the air conditioner is well supported, securely fastened, easily reachable and not obstructed (see "Dimensions“ below).
- Avoid locations with: salty or sulphurous air, draughts, dampness and flammable gas.
- If you install the drainage system, be sure to channel the condensed water to a suitable location.
- Covers, obstructions and unsteady support may cause excessive operating noise and vibration.
- The rear end of the air conditioner is splash proof. You need not shield or cover it.

8.2. Preparations Before Installation

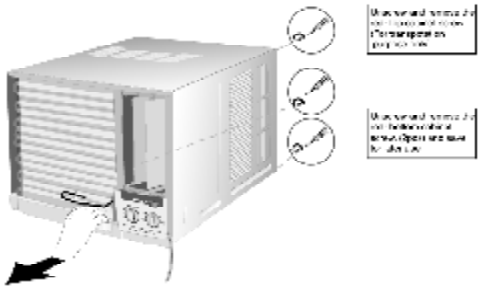
8.2.1. Dimension

- There should not be any obstacles surrounding the unit.
- Prepare an installation hole slightly bigger than the cabinet size.
- Left and right sides of the unit should be at least 15 cm away from the wall.

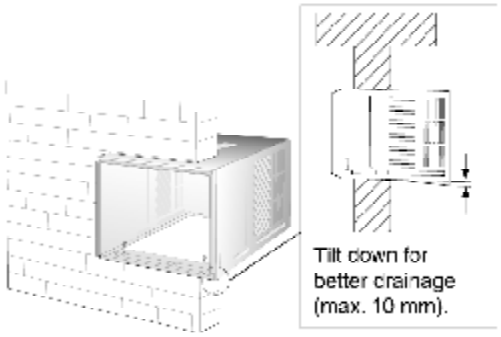


8.3. Installation Procedures

1. **Remove the rear cabinet screws and save for later use.**
2. **Slide the chassis out from the cabinet.**

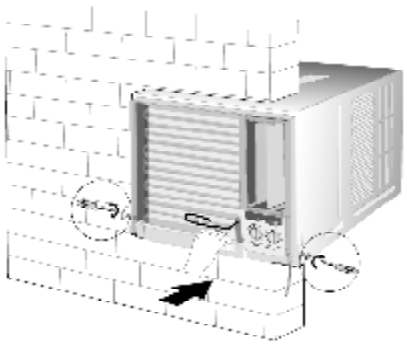


3. **Place cabinet into the installation hole.**

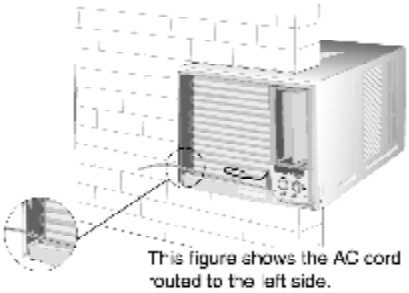


Secure it with wood screws or nails.

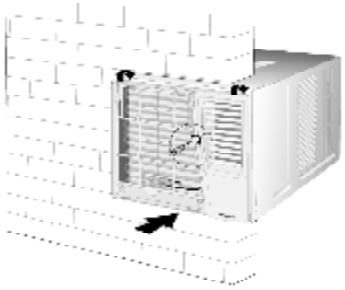
4. **Slide the chassis into the cabinet.**
5. **Reinstall the cabinet screws.**
   Secure the cabinet to chassis by using screws (from rear cabinet).



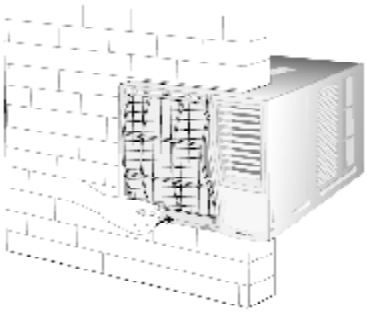
Depending upon the location of the AC outlet, route the AC cord to either the left or right side while installing the front grille.



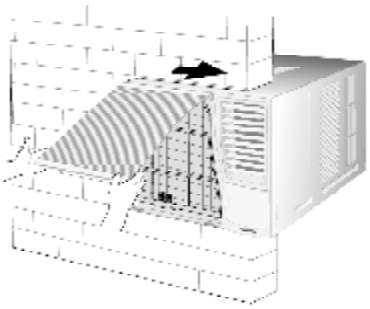
6. **Place the front grille on the cabinet first. Secure the front grille to the main chassis using screw provided**



7. **Attach the air filter to the front grille.**

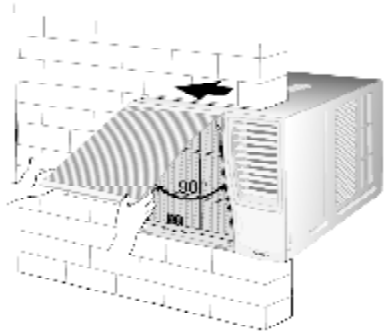


8. **Slide the front grille slightly to the right to reattach the tabs and then push it down to close tight.**



8.4. Removal of Front Grille

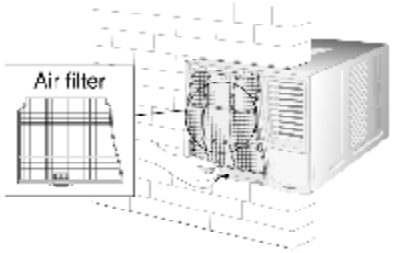
1. **Remove the front intake grille.**
   Pull up the front intake grille about 90° and slide it slightly to the left to unhook the tabs.



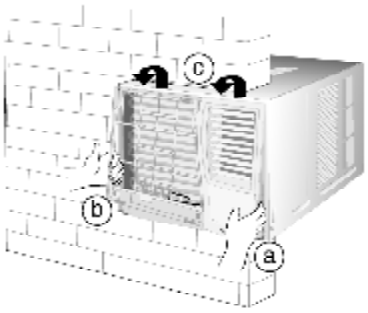
CAUTION

Do not raise the front intake grille any higher than 90° to the unit or damage to the tabs may occur.

2. **Remove the air filter.**
   Tilt up and pull out the Air Filter by the holder.



3. **Remove the front grille.**
   A. At bottom right side of the front grille, press inward on the cabinet near the power cord, and pull the grille outward to the right until right tab releases.
   B. At bottom left side, push inward on the cabinet and pull the grille outward to the left to release the left tab. Do not pull the bottom edge toward you more than 3 inches to prevent two top tabs from damage.
   C. Slide the front grille upwards to free the two top tabs from slots at the top of the cabinet.



8.5. Condensed Water Drainage

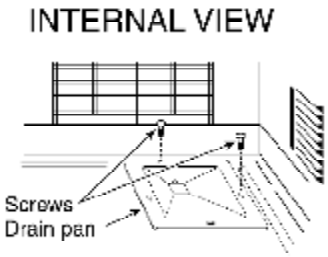
This air conditioner employs a "Slinger-Up System" which is designed to splash the condensed water on the condenser coil for maximum cooling efficiency, thus producing a splashing sound. If the splashing sound annoys you, you can provide an outside drainage by using the following procedure which may, however, cause a small loss of performance.

Note:

If the unit is installed at coastal area, drainage of condensed water is recommended to prevent the condenser being corroded easily.

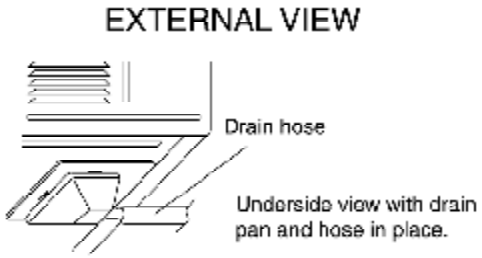
1. Remove the rubber plug and slide the chassis out from the cabinet.

2. Install the drain pan.



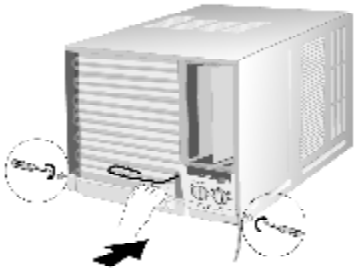
Install the drain pan at the right corner of the cabinet using 2 screws.

3. Connect a drain hose. Fit the drain hose to the drain pan.



NOTE / Drain hose or tubing can be purchased locally to satisfy your particular needs.

4. Slide the chassis back into the cabinet. Reinstall the cabinet to the chassis by using screws.



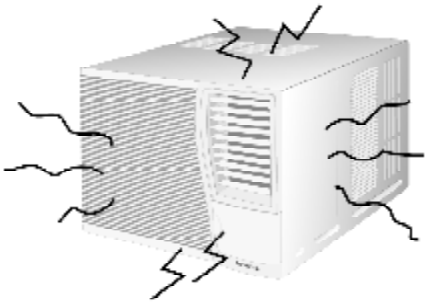
8.6. Electric Work

- Always use at the rated voltage and with a specific air conditioning circuit.
- Some installation locations may require the installation of a short-circuit breaker.
- A 16 Ampere time delay fuse or circuit breaker is required.
- Nominal cross sectional area of power supply wire must be 3 core x 1.0 mm^2 or above.
- The power supply must be from an independent circuit.
- All electrical installations must be made in accordance with local wiring and safety regulations wherever applicable.
- There must be a double pole switch with a minimum of 3 mm contact gap in the fixed installation circuit.
- Please engage an authorized dealer or specialist for the installation work.

8.7. Noise Consideration

- Select an installation location that can support the weight of the air conditioner and one that will not cause increased operating noise and vibration.
- Ensure that airflow and noise from the rear side of the unit

(outdoor) when installed do not disturb neighboring residents.
- Obstacles placed in front of the air outlet on the rear side of the unit (outdoor), or covers placed over it will cause excessive noise and deterioration in performance.



8.8. Transferring

- Repositioning or transfer of the air conditioner due to renovation or moving requires an additional service charge. Please consult your dealer before moving.

9. Care and Maintenance

⚠ Caution: / Always turn off the air conditioner and the main power supply before clean the unit. / Switch off the power supply if the unit is not going to be used for a long period of time.

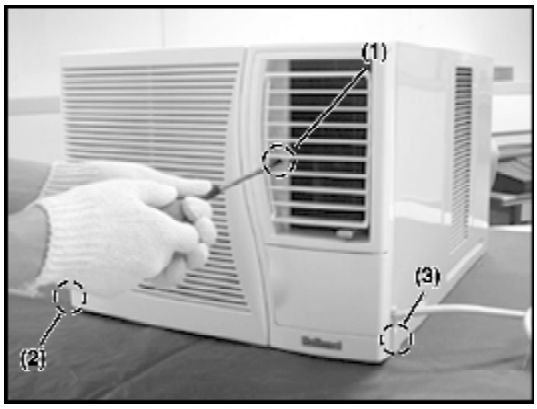
- Clean the cabinet, front grille with a mild soap or detergent and lukewarm water.
- The front intake grille can be easily removed for cleaning purposes (refer Remove the front intake grille procedures). Gently wash it with water and a sponge.
- The filter can be easily cleaned using a vacuum cleaner. Vacuum the front of the filter and then wash the rear with water. If it is badly soiled, wash with a mild household detergent.
- Do not clean with benzene, thinner, scouring powder or cloth soaked in caustic chemicals.
- If the unit is extremely dirty, heat transfer is less efficient and the unit may not cool effectively. Contact your nearest service centre for an annual chek. (Annual check is not covered under warranty)
- If the air filter becomes clogged with dust, the cooling capacity will drop, and 6% of the electricity used to operate the air conditioner will be wasted.

NOTE / Do not dry the front panel or the air filter in direct sunlight. (Exposure to direct sunlight may discolour or deform the panel.)

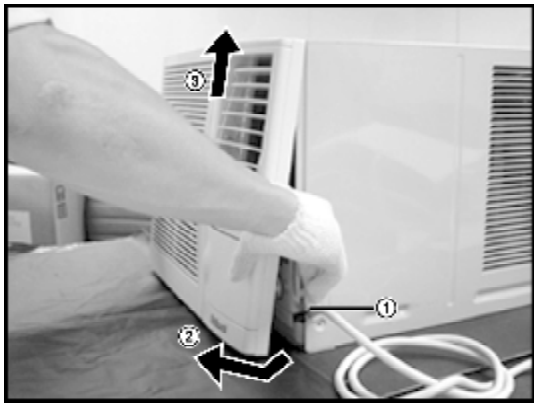
10. Servicing Information

10.1. Control Board Removal Procedure

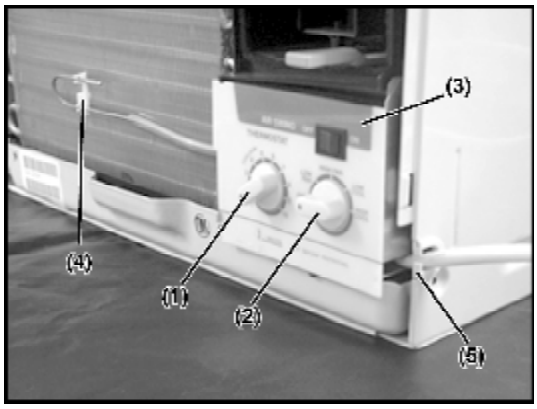
1. Remove the screws in front and both sides of the chassis as indicated (1), (2) and (3).



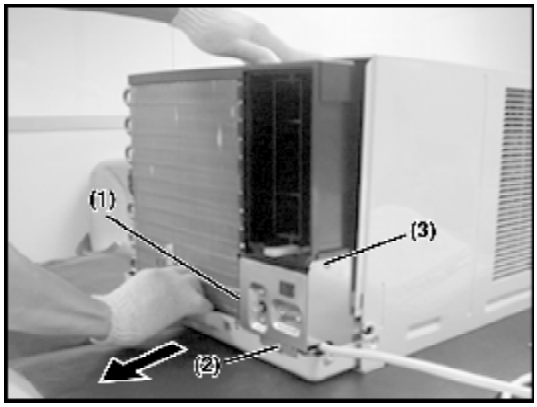
2. Release the tabs at both sides of the front grille (push in the cabinet and pull out the grille).Then, pull up the grille as to release another two tabs at the top side of the grille.



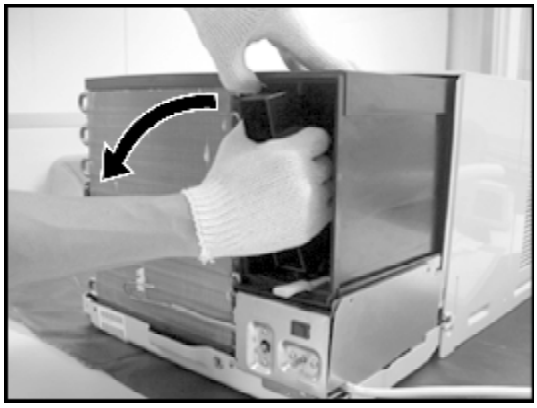
3. Pull out the knobs from its position (1) & (2) and then take out the control panel (3). Then, release the temperature sensor from its holder (4) and pull out the wire from the bushing at the cabinet (5).



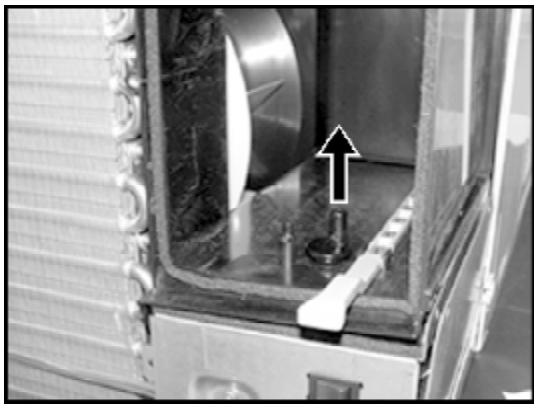
4. **Pull out the unit from cabinet by holding the hand grip at the base pan. Remove two screws in front of the control board (1) & (2). Then, remove screw at the side of control board (3) and take out the control board side plate.**



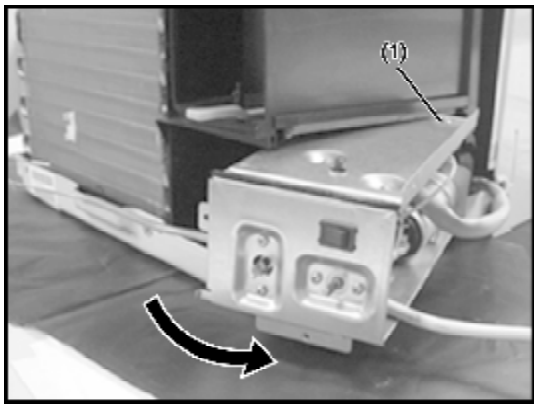
5. **Hold the horizontal vane and pull it out from the top side and get it out from its position.**



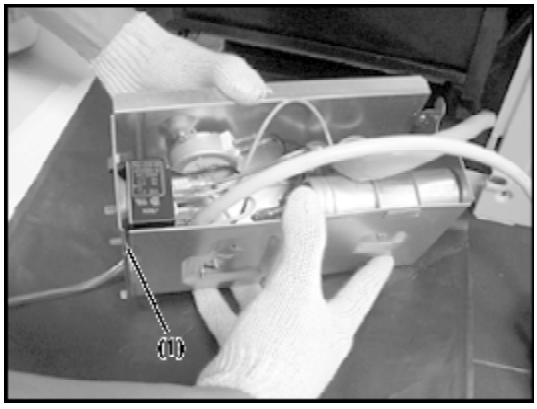
6. **Then, remove the shaft at the bottom of the compartment.**



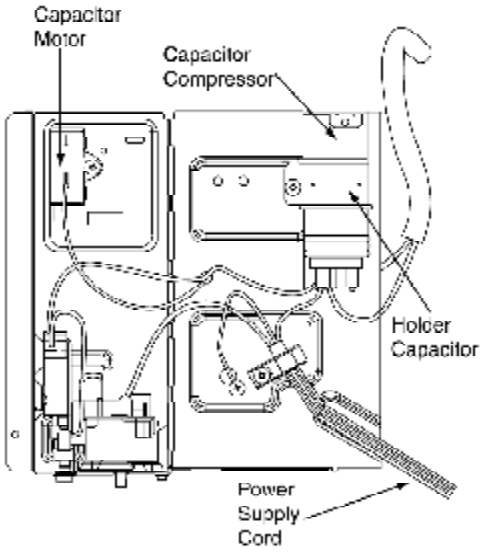
7. **Pull out the control board as shown in figure. Then remove the screw as indicated (1).**



8. **Release a hook as shown in figure (1) to open up the control board.**



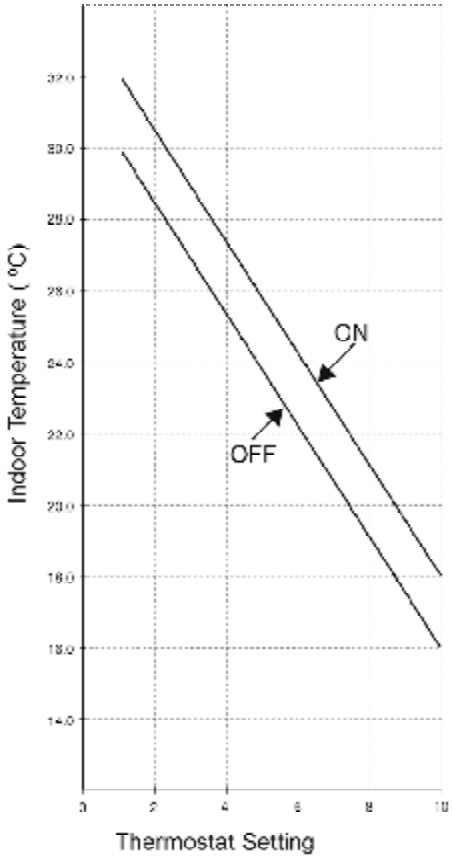
- Control Board part location.



11. Technical Data

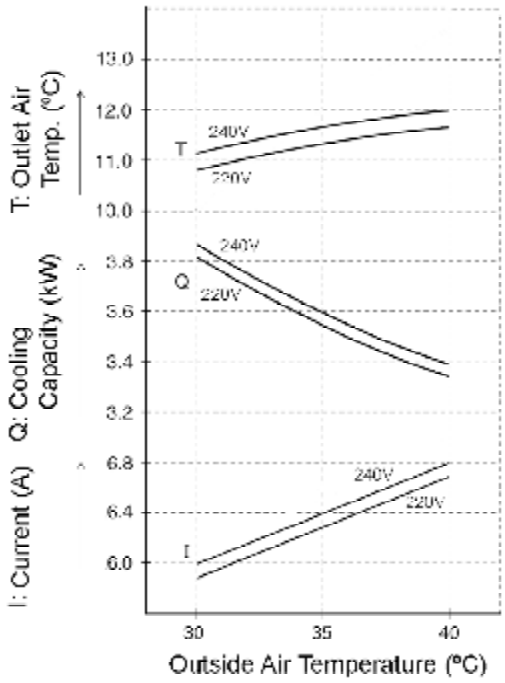
11.1. Thermostat Characteristics

- Mechanical Thermostat



11.2. Thermostat Characteristics

- Cooling Characteristics Vs. Outdoor Temperature.



11.3. Sensible Capacity Chart

11.3.1. CW-C120VR

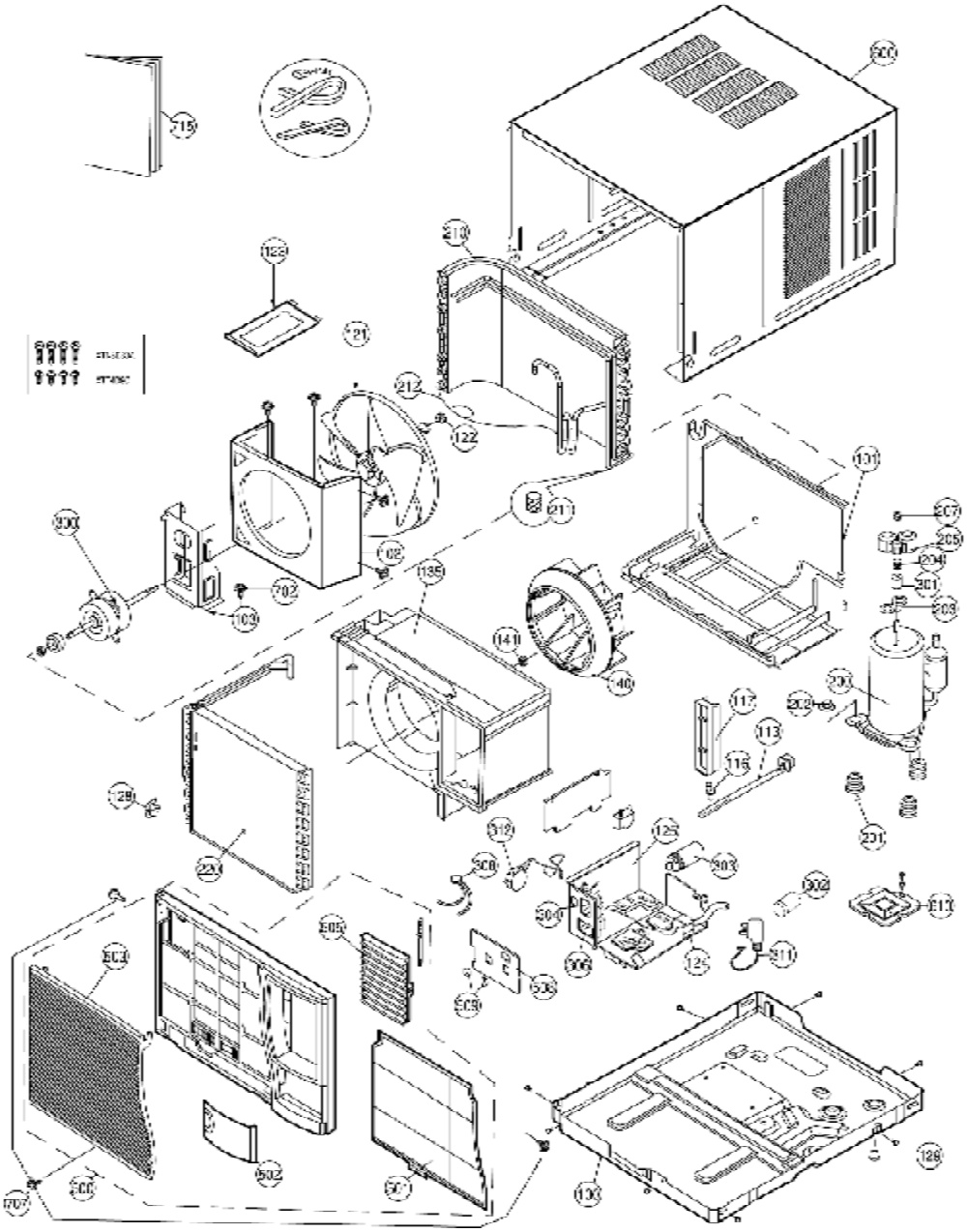
- 240 V

Indoor Wet Bulb Temperature	Outdoor Temperature										
	30 °C			35 °C			40 °C			46	
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SH
17.0 °C	3.53	3.20	1.30	3.31	3.10	1.40	3.10	2.88	1.49	2.81	2.4
19.0 °C				3.60		1.41					
19.5 °C	3.92	2.81	1.31	3.67	2.63	1.41	3.42	2.59	1.51	3.13	2.4
22.0 °C	4.36	2.63	1.33	4.36	2.30	1.42	3.78	2.05	1.54	3.46	1.8

- 220 V

Indoor Wet Bulb Temperature	Outdoor Temperature										
	30 °C			35 °C			40 °C			46	
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SH
17.0 °C	3.48	3.16	1.21	3.27	3.05	1.31	3.05	2.84	1.40	2.77	2.4
19.0 °C				3.55		1.32					
19.5 °C	3.87	2.77	1.23	3.62	2.59	1.32	3.37	2.56	1.41	3.09	2.4
22.0 °C	4.30	2.59	1.24	4.30	2.27	1.33	3.73	2.02	1.44	3.41	1.7

12. Exploded View



(Note)

- The above exploded view is for the purpose of parts disassembly and replacement.

- The non-numbered parts are not kept as standard service parts.

13. Replacement Part List

Ref. No.	Part Name & Description	Qty.	CW-C120VR	Remarks
100	Base Pan Complete	1	CWD52K1052A	
101	Bulkhead Complete	1	CWD531015	
102	Air Guide - Propeller Fan	1	CWD311020	
103	Bracket - Fan Motor	1	CWD541046	
113	Ventilation Lever	1	CWH221005	
116	Connecting Bar - Air Swing Vanes	1	CWE261039	
117	Vane - Air Swing	1	CWE241094	
121	Propeller Fan	1	CWH001011	
122	Nut - Propeller Fan	1	CWH56032	
123	Holder - Air Swing Motor	1	CWD911188	
124	Holder - Capacitor (Compressor)	1	CWH30133	
125	Control Board (Main)	1	CWH102162	
128	Holder - Sensor	1	CWH32085	
129	Drain Plug - Base Pan	1	CWH4611062	
135	Air Guide - Blower Wheel	1	CWD321051	
140	Turbo Fan	1	CWH031006	
141	Nut - Turbo Fan	1	CWH56053	
200	Compressor	1	2KS206D5DA04	
201	Bushing - Compressor Mount	3	CWH50055	
202	Nut - Compressor Mount	3	CWH4582065	
203	Gasket - Terminal Cover	1	CWB811008	
204	Holder - Overload Protector	1	CWH7041200	
205	Terminal Cover - Compressor	1	CWH707020U	
207	Nut - Terminal Cover	1	CWH7080300	
210	Condenser	1	CWB32C1282	
211	Strainer	2	CWB11101	
212	Capillary Tube	2	CWB152117	
220	Evaporator	1	CWB30C1175	
300	Fan Motor	1	CWA921145	
301	Overload Protector	1	CWA121077	
302	Capacitor - Fan Motor	1	DS441305BPQH (3 μF, 440V)	
303	Capacitor - Compressor	1	DS371356CPNA (35 μF, 370V)	
304	Main Control Switch	1	CWA07095	
306	Switch - Air Swing	1	CWA051002	
308	Thermostat Room	1	CWA151023	
311	Power Supply Cord	1	CWA20C2270	
312	Air Swing Motor	1	CWA981079	
500	Front Grille Complete	1	CWE11C2541	
501	Air Filter	1	CWD001062	
502	Grille Door	1	CWE141048	
503	Intake Grille	1	CWE221053	
505	Vane	1	CWE241093	
508	Control Panel	1	CWE312272	
509	Knob Complete - Turning	2	CWE17C1003	
600	Cabinet Complete	1	CWE00C1078	
610	Drain Pan	1	CWH40175	
702	Screw - Bracket Fan Motor	4	CWH55101	
707	Screw - Front Grille Mount	1	CWH82C1118	
715	Operating Instructions	1	CWF563657	

- The above parts are kept for seven years in accordance with MEI

service policy.

- However, longer lead time will be taken in supplying the non-numbered parts.

- All parts are supplied from MAICO, Malaysia (Vendor Code: 061).

- (A): Optional part.

[MAICO] Printed in Malaysia